feet 3 inches in length. Horns robust, turning outwards, forming a complete crescent when looked at from before; some 12 or 15 annuli on the lower half, upper half smooth; the characteristic hartebeest zigzag is only faintly reproduced. Selous has noted a hybrid between the tsessebe and the caama. Herr Matchie's *Damalis jimeru* is not clearly separated from the tsessebe. The most characteristic feature of this species is the slate-colored markings on the sides of the shoulders and flanks, while the general color is brown, fulvous or tawny.

Of the North African forms we can only mention here Hunter's hartebeest, which has a much shorter face than the typical caama. It stands some 4 feet at the withers, and is of a uniform chestnut brown, with white tail and belly. A white chevron stretches between the eyes. The horns are inclined outwards at the base, and then run vertically upwards, the greater part being quite smooth; length round curve, 26½ inches. (The Scientific African, February, 1896.)

Zoological News.—The material obtained by deep-sea dredging in the gulf off the coast of Cape Breton includes many animals hitherto considered as exclusively Mediterranean as to habitat. In view of the importance of this discovery, M. De Folin (de Biarritz) has prepared a catalogue of the species found in the collections, the first installment of which is published in the Revue des Sciences Nat. de l'ouest, April, 1896.

ENTOMOLOGY.[1]

Fossil Cockroaches.—Mr. S. H. Scudder's studies of the American Fossil Cockroaches have recently been published by the U. S. Geological Survey (Bulletin 124). Most of the forms figured and described are from the paleozoic fauna. While, in 1879, only seventeen species of cockroaches belonging to this fauna were known, there are 132 species now described.

Dr. Packard's Monograph of Bombycine Moths.—In the important memoir recently published by the National Academy of Sciences, Dr. A. S. Packard embodies the results of many years work upon the Bombyces. The volume contains about 300 quarto pages and 50 plates, many of the latter being beautifully colored. The scope

[1] Edited by Clarence M. Weed, New Hampshire College, Durham, N. H.

of the memoir is shown by the following list of contents: Introduction; Evolution of bristles, spines and tubercles of caterpilars; External anatomy of caterpillars; Incongruence between larval and adult characters of Notodontians; Inheritance of characters acquired during the life-time of Lepidopterous larvæ; Geographical distribution; Phylogeny of the Lepidoptera; Classification of the Lepidoptera; Nomenclature of wing veins; Systematic revision of the Notodontidæ.

In classification Dr. Packard adheres to the lines of the paper he recently published in the NATURALIST. The discussion of acquired characters is one of the most interesting parts of the book and is well worth reading by biologists generally. The volume is an extremely notable contribution to the literature of American entomology.

Grape Insects.—Mr. C. L. Marlatt contributes to the recent Year Book of the Department of Agriculture a valuable discussion of the Insect Enemies of the Grape. In the introduction he says: Upward of 200 different insects have already been listed as occurring on the vine of this country, and the records of the Department alone refer to over 100 different insects. Few of these, however, are very serious enemies, being either of rare occurrence or seldom numerous, and for practical purposes the few species considered below include those of real importance. They are the grape phylloxera, the grapevine fidia, both chiefly destructive to the roots; the caneborer, destructive particularly to the young shoots; the leaf-hopper, the flea-beetle, rose-chafer with its allies, and leaf-folder, together with hawk moths and cutworms, damaging foliage, and the grapeberry moth, the principal fruit pest.

The extent of the loss that frequently results from these insects may be understood by reference to a few instances. The phylloxera, when at its worst, has destroyed in France some 2,500,000 acres of vineyards, representing an annual loss in wine products of the value of $150,000,000, and the French Government had expended, up to 1895 in phylloxera work over $4,500,000, and remitted taxes to the amount of $3,000,000 more. The grapevine fidia, on the authority of an Ohio correspondent, in a single season in one vineyard, killed 400 out of 500 strong five-year-old vines. The prominent leaf-defoliators, as the rose-chafer and flea-beetle, frequently destroy or vastly injure the crop over large districts, and the little leaf-hopper, though rarely preventing a partial crop, is so uniformly present and widely distributed as to probably levy a heavier tribute on the grape in this country than any other insect.

Flower-Haunting Diptera.—Mr. G. T. Scott Elliott has made numerous observations which go to show that flower-haunting Diptera are of much importance in pollination. He thinks that his evidence clearly proves the color-sense of the Diptera observed, and also that they "are, on the whole, more intelligent than the lower class Hymenoptera." "It is to these Diptera," he says, "that we probably owe all of the neatly made, small and bright colored forms of flowers." The author gives tables showing the visits of about sixteen Diptera to various types of flowers, and compares these with the visits paid by Hymenoptera. He suggests that the Diptera map out the ground as vultures do, and keep flying up and down over a chosen area. At the beginning of his paper,[2] there is an interesting note on the part which insects play in *isolation*. Thus if flowers of the same species occur partly inside a sheltered wood, and partly outside, probably not more than five per cent of those outside will be fertilized by pollen from those inside the wood and *vice-versa*. This means for reproduction almost perfect isolation.—*Journal Royal Micr. Society.*

Larval Habits in Panorpa.—Dr. E. P. Feldt contributes to the tenth report of the State Entomologist of New York an important paper on Scorpion fleas from which we quote the following relating to *Panorpa rufescens:*

"Throughout their different stages, the larvæ usually harmonize with their surroundings so closely that it is difficult to detect them. Frequently a slight motion of the earth is the first indication of their presence. They burrow in the earth and remain underground much of the time. Many burrows ran less than one inch below the surface, although a few extended to a depth of three or four inches. The larvæ may be fed readily upon raw meat placed upon the surface of the ground. Some time after placing the meat in the cage, they may be found under it, frequently in a more or less cell-like depression. When in such a position they rarely try to escape, but trust to their protective resemblances, and remain motionless. Around the edge of the piece of meat and also under it, the mouths of burrows may be seen and in them the heads of larvæ; when in such positions they dodge back quickly at the least disturbance. Unless the meat is moved very cautiously the burrows will appear empty; but if quiet is maintained for a few moments, the heads will soon be seen. The burrows opening under the meat frequently come to the surface a little distance away, and it is quite easy to drive a larva out of its back door. Not infre-

[2] Trans. Ent. Soc. London, 1896, pp. 117–118.

quently they have been observed to emerge from a burrow for their feeding. This usually occurred in the afternoon. On one of these occasions a little fellow was watched through a simple lens. It was interesting to see him bite off a piece of meat and swallow it with every evidence of satisfaction. The antennæ were moved back and forth in the most appreciative way. As the larvæ increase in size, more burrows open upon the surface and they are seen lying at their mouths. One time two were seen out of adjacent burrows. The larger seized the smaller in the back and tried to drag it down into its burrow. The smaller was unable to escape, and when it was pulled away with forceps the body-wall was ruptured. At another time a smaller active larva was seen to attack a larger inactive one, which, unable to resist, was bitten so severely that the segment swelled considerably, but was not ruptured. In a day or two the larger died and was fed upon by its former persecutor.

EMBRYOLOGY.[1]

The Wrinkling of Frog's Eggs During Segmentation.—The occurrence of wrinkles in frog's eggs during the process of segmentation was first observed and very briefly described by Prevost and Dumas, who have the honor of being the first observers of the segmentation itself (Annales des Sciences Naturelles, I ser., 1824, Tom II, p. 110).

A somewhat better description was given later by Bär (Archiv. für Anatomie, etc., 1837) and Reichert (the same, 1841), who gave to the phenomenon the name "Faltenkranz," and made some attempt to explain its nature and origin.

By far the best description, and, indeed, the only really good one which has ever been published, is that by M. Schultze, which appeared in 1863 (Observationes nonnullæ de ovorum ranarum segmentatione, Bonnæ).

He gives an excellent account of wrinkles observed in the eggs of *Rana temporaria* and *R. esculenta*, and concludes with an "explanation of their origin." But he really devotes only a very few lines to the explanation, and gives up the remainder of this portion of his paper to

[1] Edited by E. A. Andrews, Baltimore, Md., to whom abstracts reviews and preliminary notes may be sent.